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Capelin Acoustic Biomass Survey of NAFO Division 2J3K September 29-October 22, 1984

by

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Abstract

An acoustic survey for capelin was carried out from the research vessel GADUS ATLANTICA in NAFO Division 2J3K during the period September 29 to October 22, 1984. Capelin biomass was estimated at 860,000 t. Age and length compositions from samples taken during the acoustic survey are presented.

Résumé

Lors d'une sortie du navire de recherche Gadus Atlantica effectuée du 29 septembre au 22 octobre 1984 dans la Division 2J3K de l'O.P.A.N.O., on a fait le relevé des capelans par sondage acoustique. La biomasse de capelans est estimée à 860 000 t. On décrit la composition par âge et par longueur des échantillons prélevés au cours du relevé.

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Introduction

This survey is part of a series of annual acoustic surveys for capelin in the Newfoundland area. An acoustic survey is also carried out by the USSR in Division 2J3K in the fall of each year. In the past, the results of these surveys have provided the scientific basis for quota management of this stock.

Materials and Methods

The survey was conducted in NAFO Division 2J3K during the period September 29-October 22, 1984. Data were collected in an identical manner as outlined for the 1983 survey (Miller and Carscadden 1984). Replicate surveys were carried out in two of the five blocks surveyed. Target strengths were determined for each survey block in a manner identical to the 1983 survey.

Results

Five survey blocks with associated fishing sets were carried out in 1984 as shown in Figure 1. In the most northerly block (E), which actually extended into Division 2H, no acoustic data were recorded and two midwater trawl fishing sets in this block indicated that no capelin were present. Consequently, this survey block was not included in the capelin acoustic biomass estimate. Figure 2 indicates age and length composition from samples obtained by fishing during the survey. Total distributions are a mean of the block samples weighted by the biomass estimate for each block. 1982 year-class capelin were predominant in the total age structure. Table 1 and 2 summarize the acoustic survey results. Block C was comprised of replicate surveys of eight transects each while Block D had replicates of eight and seven transects. Biomass estimates differed by 16% for Block C and 9% for Block D between replicate surveys. Replicate surveys were combined for the overall biomass estimate. Table 3 summarizes results of the 2J3K acoustic surveys for 1981-84. No acoustic estimate was provided in 1982.

References

Miller, D. S. and J. E. Carscadden. 1984. Capelin Acoustic Biomass Survey for NAFO Division 2J3K, October 1983. CAFSAC Res. Doc. 84/79, 10 p.

Table 1. Summary of acoustic survey results from NAFO Division 2J3K, 1984.

Block	Area (km^2)	Mean weight (gm)	Total strength (dB)	Biomass/m^2 (gm)	Delta	Lower limit of Delta	Coefficient of variation	Total biomass
A	20562	10.2	-53.6	0.86	0.95	-.03	0.62	17683
B	13263	9.2	-54.3	1.41	0.96	-.03	0.26	18701
C	14692	12.2	-52.7	14.05	0.97	-.02	0.18	206423
D	20978	18.1	-50.9	29.39	0.98	-.02	0.14	616543
Total	69495			12.37				859350
C1	14692	12.2	-52.7	15.20	0.97	-.02	0.27	222318
C2	14692	12.2	-52.7	12.86	0.96	-.03	0.22	188939
D1	20978	18.1	-50.9	31.98	0.98	-.02	0.21	670876
D2	20978	18.1	-50.9	26.45	0.97	-.02	0.14	554868

Table 2. Number of transects (t), transect length, the range of mean densities ($\bar{X}_i$) and the range of intervals (n_i) per transect for each survey block.

Block	t	Length (km)	Range of $\bar{X}_i$'s	Range of n_i's
A	10	60.9	0.18-6.01	36-45
B	6	65.3	0.42-2.64	38-42
C	16	66.9	0.38-32.10	38-49
D	15	82.3	1.65-59.99	47-54
C1	8	66.9	0.38-32.11	38-49
C2	8	66.9	3.85-25.17	39-44
D1	8	82.3	1.65-59.99	47-53
D2	7	82.3	7.65-40.68	48-54

Table 3. Numbers and biomass at age of capelin from Division 2J3K acoustic surveys.

		Age				
		1	2	3	4	5
GADUS 100 1984	No.'s (billions)	6.8	36.1	7.4	4.0	0.3
	Biomass ('000 t)	29.4	518.9	189.1	109.8	11.7
GADUS 85 1983	No.'s (billions)	12.4	5.5	2.4	0.3	0.1
	Biomass ('000 t)	78.6	82.7	53.8	8.1	0.4
GADUS 56 1981	No.'s (billions)	84.0	71.0	10.0	2.0	1.0
	Biomass ('000 t)	414.0	1063.0	227.0	57.0	29.0

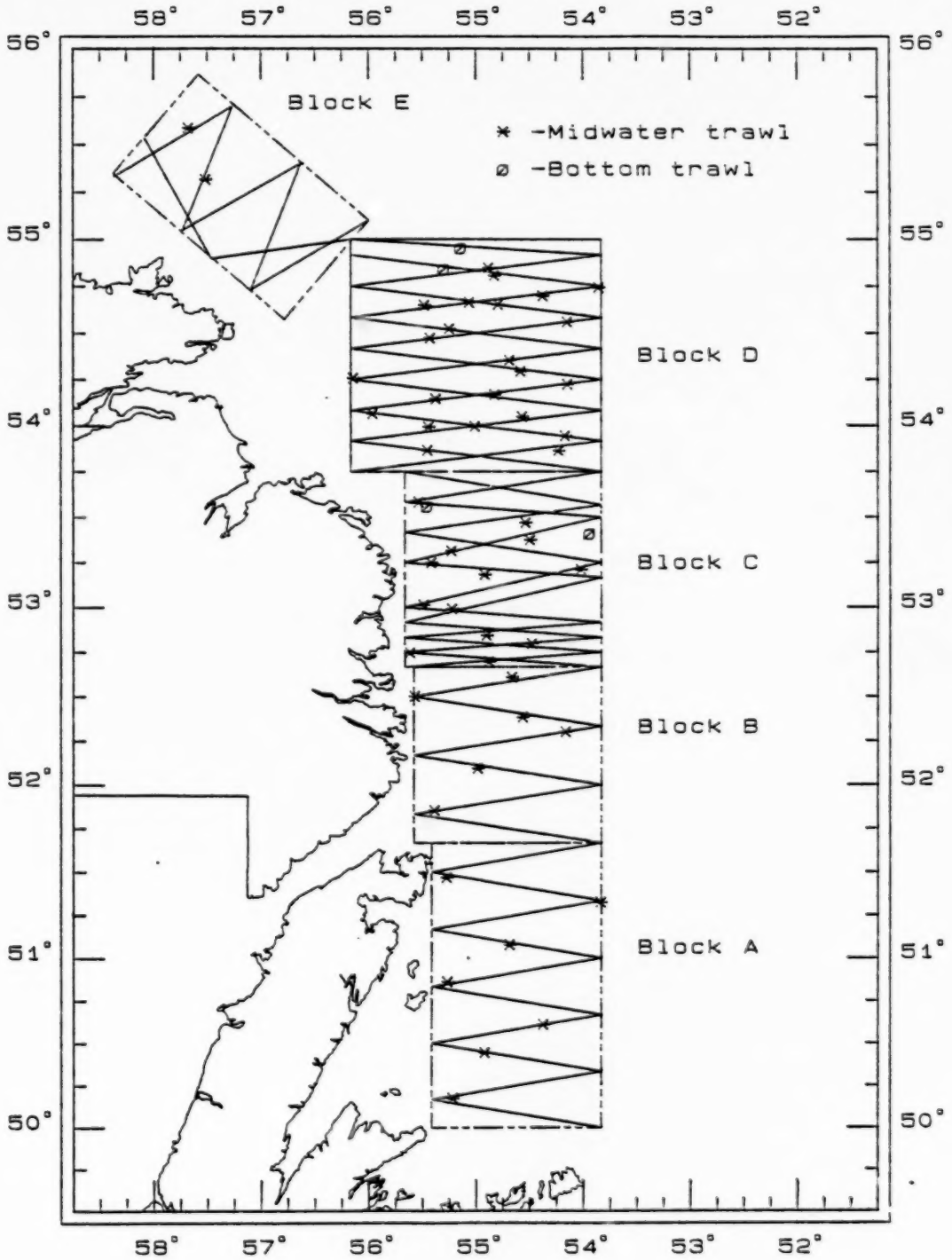

Figure 1. Acoustic survey track and fishing set locations for Gadus Atlantica Cruise 100.

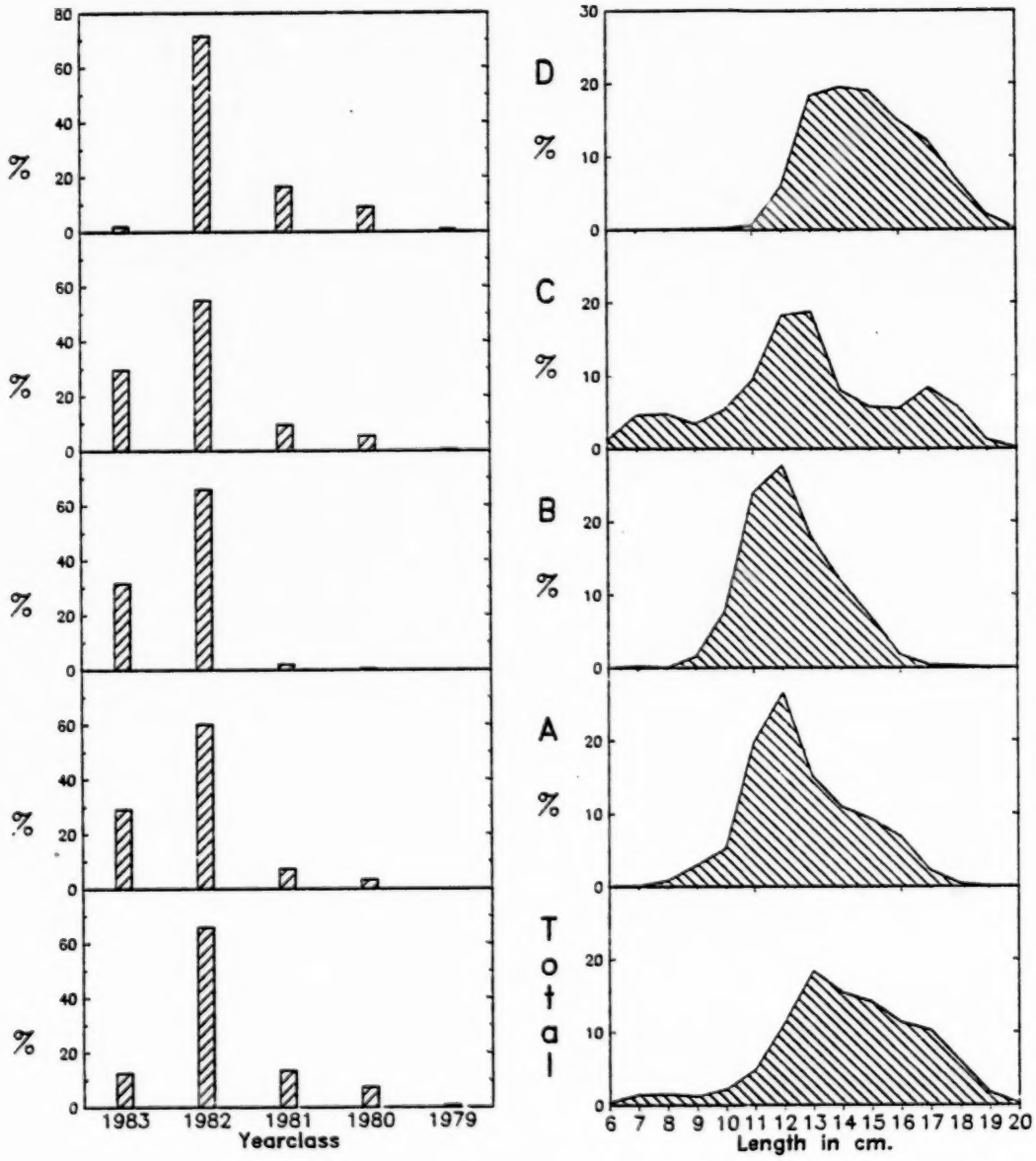

Figure 2. Age and length composition of capelin samples from Gadus Atlantica cruise #100